

XIII. Watershed Management Approach

Ecoregions serve as a geographical framework for establishing regional water quality expectations. The watershed approach serves as an organizational framework for systematic assessment of the state's water quality problems. By viewing the entire drainage area or watershed as a whole, the Department is better able to address water quality problems through an organized systematic cycle. This unified approach affords a more in depth study of each watershed and encourages coordination of public and governmental organizations. The watersheds are addressed on a five-year cycle that coincides with permit issuance.

A. Watersheds and Ecoregions

The same year the ecoregion monitoring started in 1996, the Division adopted a new way to organize stream assessments called the Watershed Management Approach. This is a framework to organize stream assessments and pollution control measures. It coordinates public and government pollution prevention programs as well as stream assessment and plant inspections. This format organizes streams into major drainage areas called watersheds. The United States Geological Service, USGS, has identified 54 watersheds in Tennessee.

A geographic area that drains to a common outlet is called a watershed.

Rainwater runs downhill picking up soil, trash, pesticides, oil, and other pollutants. The water drains into small streams that flow into larger streams and eventually into rivers or reservoirs. A geographic area that drains to a common outlet, such as a point on a larger river or lake, underlying aquifer, estuary wetland or ocean is called a watershed. By considering the entire watershed, pollution sources can be addressed

before they become a problem in the receiving stream.

Water drains from the highest elevations in a watershed down to the receiving river or reservoir crossing different geographical ecoregions. Therefore, each watershed contains several ecoregions and each ecoregion crosses several watersheds. The water quality expectations are based on the ecoregion the river or stream is located in. The monitoring year is determined by which watershed a stream or river is located in.

B. Watershed Cycle

The 54 watersheds have been divided into five monitoring groups for assessment purposes (Figure 23 and Table 12). One watershed group is assessed each year. This allows intense monitoring of a limited number of watersheds each year with all watersheds to be monitored every five years. The group four and group five watersheds have been intensely monitored in the two years covered by this report.

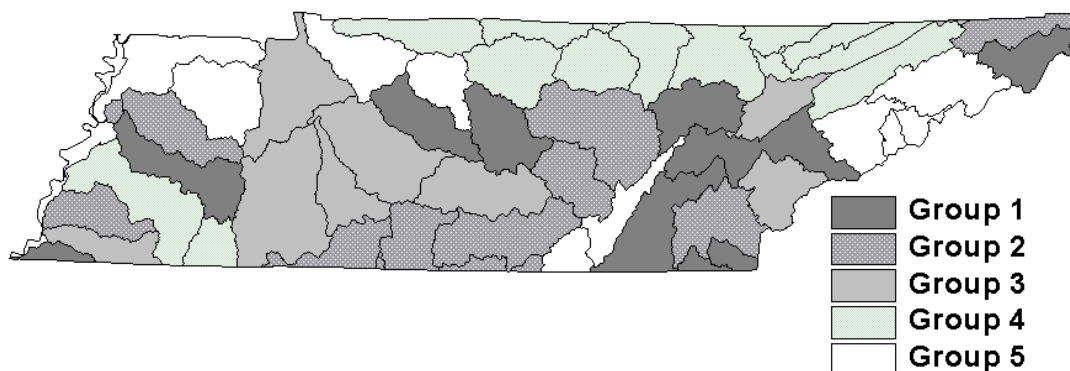


Figure 23: Watershed Cycle Monitoring Groups

The five-year watershed cycle provides for a logical progression from data collection and assessments through TMDL development and permit issuance (Figure 24). The watershed cycle coincides with the discharge permits that are issued to industries. The key activities involved in each five-year watershed cycle are as follows:

1. **Planning and Data Collection-** Existing data and reports from appropriate agencies and organizations are compiled and used to describe the quality of the rivers and streams.
2. **Monitoring** – Field data is collected for key streams in the watershed. These data will supplement existing data and are used for water quality assessment.
3. **Assessment** – Monitoring data is used to determine if the streams support their designated uses.
4. **Wasteload Allocation/ Total Maximum Daily Load (TMDL) –** Monitoring data is used to determine pollutant limits for permitted dischargers releasing wastewater to watershed. Limits are set to assure that state water quality is protected. The TMDL program locates the continuing pollution problems in the state and then identifies how to correct the problem. The Total Maximum Daily Load is a sum of all the pollution sources plus a margin of safety.

$$\textbf{TMDL} = \textbf{non-point source} + \textbf{point source} + \textbf{margin of safety}$$

The five steps of the TMDL process are as follows:

- a. Identify water quality problems.
- b. Prioritize water quality problems.
- c. Develop TMDL plan.
- d. Implement water quality improvement actions.
- e. Assess water quality improvement actions.

5. **Permits** – Issuance and expiration of all discharge permits are synchronized based on watersheds. Approximately 1700 permits have been issued in Tennessee under the federally delegated National Pollutant Discharge Elimination System (NPDES).
6. **Watershed Management Plans** – These plans will include information for each watershed including general watershed description, water quality goals, major quality concerns and issues and management strategies.

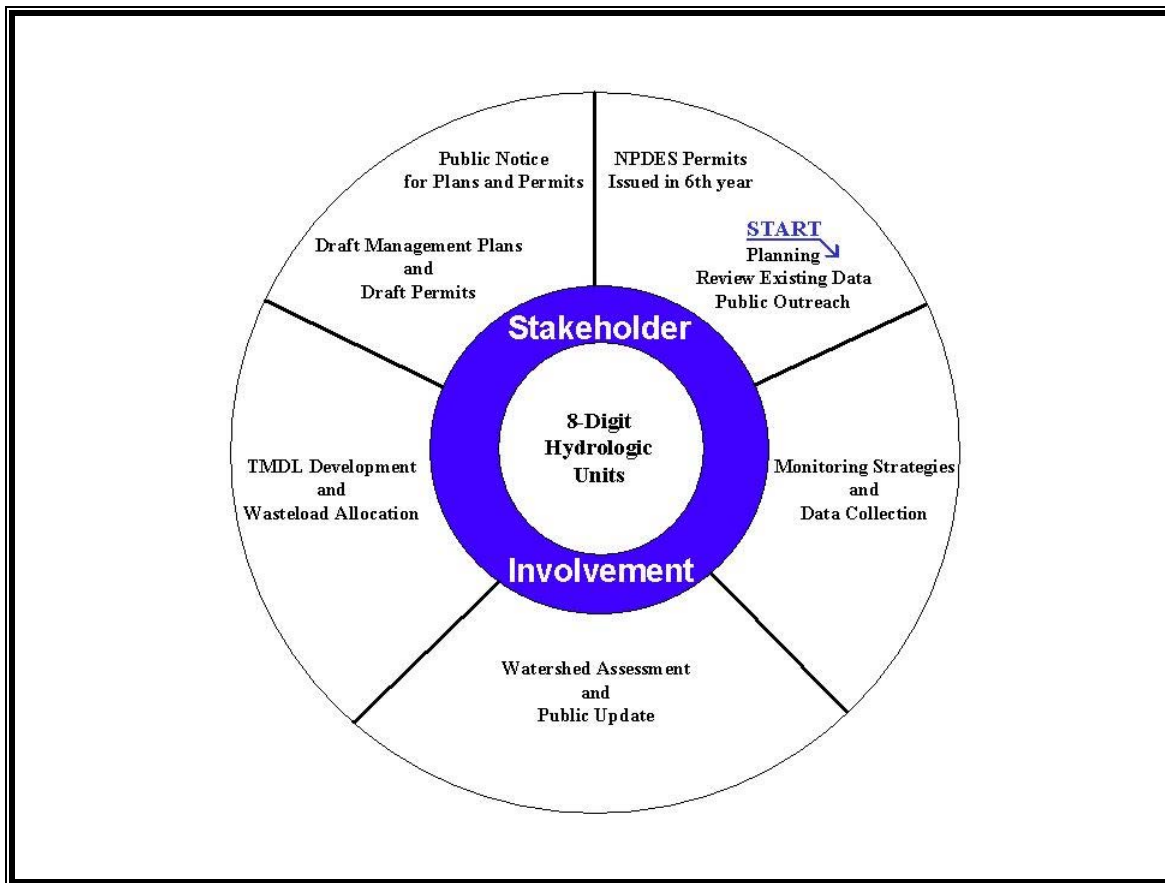


Figure 24: Watershed Cycle

One of the advantages of this approach is that it considers all sources of pollution including discharges from industries and municipalities as well as runoff from farms and cities. Another advantage of the unified approach is the coordination of local, state, and federal agencies and the encouragement of public participation.

Table 12: Watershed Groups

	Monitoring Years	West Tennessee	Middle Tennessee	East Tennessee
Group 1	1996 2001 2006 2011 2016	➤ Nonconnah ➤ South Fork of the Forked Deer	➤ Stones ➤ Harpeth	➤ Watts Bar* ➤ Ocoee ➤ Emory* ➤ Watauga ➤ Conasauga
Group 2	1997 2002 2007 2012 2017	➤ Loosahatchie ➤ North Fork Forked Deer ➤ Forked Deer	➤ Collins ➤ Caney Fork ➤ Wheeler Res. ➤ Upper Elk ➤ Lower Elk ➤ Pickwick Res.	➤ Hiwassee ➤ Fort Loudoun* ➤ South Fork Holston
Group 3	1998 2003 2008 2013 2018	➤ Wolf ➤ Upper Kentucky ➤ Lower Kentucky	➤ Upper Duck ➤ Lower Duck ➤ Buffalo	➤ Lower Tennessee ➤ Little Tennessee* ➤ Lower Clinch* ➤ North Fork Holston ➤ South Fork Holston
Group 4	1999 2004 2009 2014 2019	➤ Lower Hatchie ➤ Upper Hatchie	➤ Red ➤ Barren ➤ Cumberland (Old Hickory Reservoir) ➤ Upper Cumberland (Cumberland Lake) ➤ Upper Cumberland (Cordell Hull) ➤ Obey	➤ South Fork Cumberland* ➤ Upper Cumberland* ➤ Powell* ➤ Upper Clinch* ➤ Holston* ➤ Lower Tennessee ➤ Clear Fork
Group 5	2000 2005 2010 2015 2020	➤ Mississippi ➤ Lower Obion ➤ South Fork Obion	➤ Barkley Reservoir ➤ Cheatham Reservoir ➤ Gunterville Reservoir	➤ Sequatchie ➤ Upper French* ➤ Lower French* ➤ Pigeon* ➤ Nolichucky

*These watersheds are monitored the following year.

XIV. Public Participation

Everyone contributes pollution every day in large or small ways. Often a careless or thoughtless act results in far reaching damage. By understanding how pollution impacts our world and what each of us can do to reduce pollution, collectively we can make a difference in Tennessee and the world.

Get Involved

Politicians care about your thoughts and your votes, so let your voice be heard. Environmental laws encourage public participation. Insist that environmental issues be considered in the local planning process.

Find out which watershed you live in and attend TDEC's watershed meetings. Watershed meetings are held in the third and fifth years of the watershed cycle.

The meeting dates and times are posted on our website at:

<http://www.state.tn.us/environment/news/ppo>

Reduce, Reuse, and Recycle

Whenever possible recycle metal, plastic, cardboard and paper, so it can be reused to make new products. Always dispose of toxic materials properly. Most auto parts stores and many service stations collect used motor oil and auto batteries for recycling. Most counties have annual toxic waste collection days for old paints, pesticides, and other toxic chemicals. Check with your local waste management service for specific dates and times.

Conserve water and electricity both at home and at work. Every gallon of water that enters the sewer must be treated. The production of energy uses natural resources and produces pollution. You will not only prevent pollution, but also save money.

For further information on pollution prevention please see the website.

<http://www.state.tn.us/environment>

Be Part of the Solution, Not Part of the Problem

1. Dispose of chemicals properly

Always dispose of toxic chemicals properly. Never pour oil, paint, or other leftover toxic chemical on the ground, in a sinkhole, or down a drain. If you have a septic system check it periodically to make sure it is functioning correctly to protect surface and ground water.

2. Use chemicals properly

Use all chemicals, especially lawn chemicals, exactly as the label instructs. Every year millions of pounds of fertilizer and pesticides are applied to crops and lawns. Much of the fertilizer and pesticides applied to vegetation is carried by rainwater to streams and reservoirs. Over application of fertilizers and pesticides wastes money, risks damage to vegetation, and pollute waterways. Therefore use all chemicals, especially lawn chemicals, cautiously.

3. Prevent erosion and runoff

It is important for farmers and loggers to work closely with the Department of Agriculture (TDA) personnel to prevent erosion and runoff pollution. TDA can help implement Best Management Practices (BMP's) to reduce soil loss and prevent pollution of streams. Never buy gravel or rocks that were illegally removed from streams.

4. Obtain a permit

Contractors wishing to alter a stream or wetland need to obtain a permit from the TDEC, Aquatic Resource Alteration Permit (ARAP) section. Additionally, construction sites must be covered under a General Permit for the Discharge of Stormwater for a Construction Activity. Coverage can be obtained by contacting the local TDEC EAC office.

A work site must be properly stabilized to avoid erosion. All silt retention devices must be properly installed to protect a site from soil loss and streams from siltation. If you hire anyone to do any work around a stream make sure the contractor has obtained the proper permits and knows how to protect the stream. The landowner is ultimately responsible for any work done on his land.

Although this report is on surface waters in Tennessee we are concerned about all pollution. Given enough time, all pollution ends as water pollution. Air pollution eventually settles out or falls out as rain and enters streams. Buried waste seeps into ground or surface water. So properly dispose of all waste. Never burn toxic materials like tires or oil. Keep your car properly tuned and in good condition.

Report Pollution

The public is the main source of information on pollution. If you see pollution, please let us know. Most people in Tennessee are only a phone call away from their local office of the Division of Water Pollution Control. A map of Tennessee's Environmental Assistance Centers (EAC) appears on the next page. If your EAC is not a local call, please use our toll free number that will connect you to your nearest office.

Call your local Environmental Assistance Center. See the map on the next page.

Or

**If your local EAC is a long distance phone call,
please call toll free.
1-888-891-TDEC
1-888-891-8332**

You may also contact the Division by leaving a message on our website.

<http://www.state.tn.us/environment>

One of the most important sources of information about water quality problems are citizens. When a call is received Division staff investigate the complaint and attempt to identify the source of the pollution. If the polluter is identified, enforcement action will be taken.

If you see one of our staff members performing a stream survey, stop and talk. We will be happy to show you what we are doing. In fact, you may be able to help us answer some questions.

If you see any of the following problems please call.

More than just a few dead fish in a stream or lake.

Someone pumping a liquid from a truck into a stream (especially at night).

Unusual colors, odors, or sheen in a stream or lake.

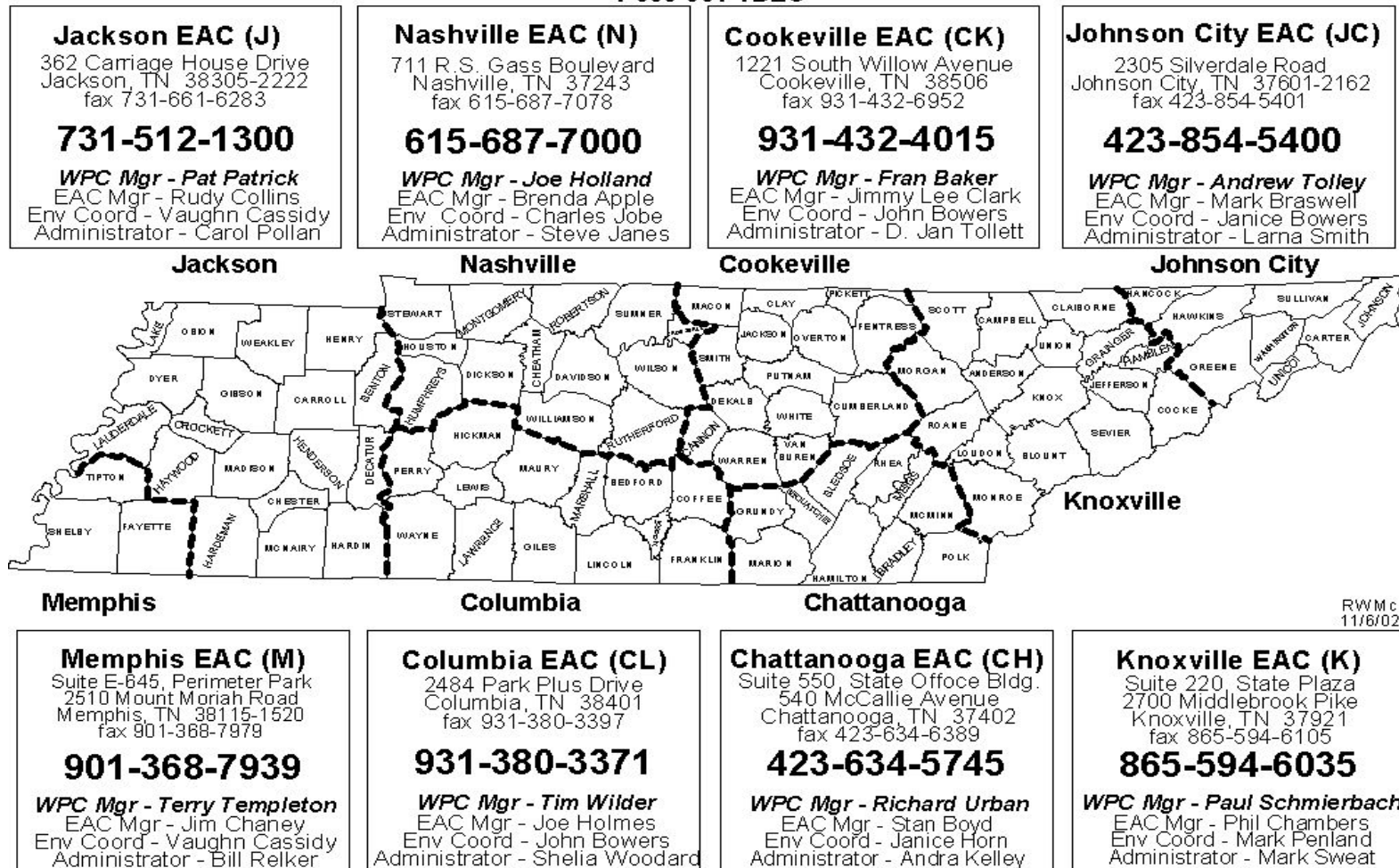
Construction activities without proper erosion control (silt fences, hay bales, matting).

Bulldozers or backhoes in a stream removing gravel or rocks.

Groups of people removing rocks from streams, especially on the Cumberland Plateau.

Sewage pumping stations discharging directly or indirectly into a stream.

**Tennessee Department of Environment and Conservation
Environmental Assistance Center Boundaries
1-888-891-TDEC**



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Water Pollution Control

Figure 25: TDEC Environmental Assistance Center Boundaries

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